Working Papers

Disentangling the Dynamics of Family Poverty and Child Disability: Does Disability Come First?

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Working Paper No. 03-01

March 25, 2003

Center for Social Development

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The passage of welfare reform in 1996 inexorably altered the relationship between the U.S. government and what are arguably its least able citizens. Not only were adults in families receiving Aid to Families with Dependent Children (AFDC) now required to begin working a stipulated number of hours per week, but the federal legislation made no accommodations for families whose children, due either to chronic illness or disability, required additional parental time and resources. The impact of federal welfare reform legislation on these families has been the subject of ongoing examination. This paper provides background for the analysis of such policy implications by analyzing the causal relationship between poverty and child disability. Despite a plethora of research on the general association between poverty and child disability, the *direction* of causation between these two factors remains unclear. We don't know whether children with disabilities are more likely to be born into families in poverty than children without disabilities. For many families, poverty may result from the birth of the disabled child rather than be a causal factor in the disability. In this paper we explore this proposition by following families backward in time in order to examine their characteristics before and after the birth of their children.

Approximately 18 percent of families in the U.S. have at least one child with a diagnosed disability or chronic illness (such as asthma) who require health or related services above those required by children generally (Newacheck, Strickland, Shonkoff, Perrin, McPherson, McManus, Lauver, Fox, & Arango, 1998). Point-in-time research indicates that children with disabilities, both physical and mental, are significantly more likely to live in families in poverty than are children without disabilities (Porterfield, 2002; Halfon & Newacheck, 1999; Bowe, 1995). This statistic is exacerbated in families receiving welfare. Single-mother families who have ever received welfare cash assistance are nearly twice as likely to be caring for a child with a chronic illness or disability as mothers who have never received AFDC (Heymann & Earle, 1999). Similar trend data indicate that childhood disability rates are increasing over time, with a relative risk of disability among children in single-parent families of 1.55 and for children in poor households of 1.86 compared to children in non-poor, two-parent families (Fujiura & Yamaki, 2000).

Only one previous paper appears to have addressed this issue of causality. Case, Lubotsky, & Paxson (2001) examined the association between family income and child health, looking specifically at chronic health conditions in children. While chronic health conditions are not an exact proxy for disabilities, the study does shed some light on the causal factors by examining family income and child health status at the time of the birth of the child. The authors rule out health at birth as a causal factor and point instead at the significantly higher incidence of developmental delays and exacerbation of chronic health problems among children in low-income families. Low parental education, a known correlate of low-income families, was also found to negatively affect children's health status.

Several researchers have examined the relationship between poverty and trends in childhood disadvantage (Foster & Furstenberg, 1999; Duncan, Brooks-Gunn, & Klebanov, 1994). Lower levels of cognitive development (generally measured by IQ scores) and higher risks of mental health problems and behavioral problems are found among children who live in economically-disadvantaged families and/or high-risk (low-income) neighborhoods (Newacheck, Hung & Wright, 2002; Newacheck, Stein, Bauman, & Hung, 2003). These studies suggest that the lack

of economic prospects for poorly-educated parents may be one driving force behind child outcomes.

Several studies have found lower parental (particularly mothers') employment in families with children with disabilities (Porterfield, 2002; Warfield, 2001; Kuhlthau & Perrin, 2001; Powers, 2001; Lukemeyer, Meyers, & Smeeding, 2000; Acs & Loprest, 1999; Wolfe & Hill, 1995; Breslau, Salkever, & Staruch, 1982). Mothers, especially those who are married, with disabled school-age children are less likely to engage in paid work or to work full time than mothers with school-age non-disabled children (Porterfield, 2002). Kuhlthau and Perrin (2001) found similar lower employment rates among fathers of disabled children. Curran, Sharples, White, and Knapp (2001) attributed these lower employment rates to the significantly greater time costs of caring for a child with disabilities. Lukemeyer et al. (2000) found in their sample of families on welfare that even these poor families had out-of-pocket expenses associated with their disabled child, exceeding $100 per month for about 20% of families. These families had lower incomes than families with non-disabled children.

With the exception of the study by Case et al. (2002), all previous research in this area examines families only after their children with disabilities have been born, using as a comparison group families who have children without disabilities. This study extends previous research by looking back in time prior to the birth of the child to gauge the income trajectory the family was on and compare this trajectory with changes that occurred in the family after the birth of their first child.

Theoretical Framework

Two models—Life Course Theory and the social model of disability—are utilized in this study and form the theoretical foundation of our analysis. Life Course Theory, developed by Glen Elder (1999), focuses on the life course as a process by which people move between successive events and conditions. The social life course refers to the intertwined trajectories (e.g., work and family careers) that are subject to changing conditions as well as short-term transitions (e.g., birth, school entry, retirement). The application of life course theory to families with children with disabilities is clear; here the birth of a disabled child represents an "event" which may significantly alter the trajectory the family was on prior to the birth.

Particularly relevant to the families of children with disabilities is the Principle of Human Agency (Elder, 1999). Within the context of Life Course Theory, human agency refers to the ability of individuals to construct their own life course through the choices and actions they take within the opportunities and limitations of history and social circumstance (Elder, 1999). While this principle suggests that individuals or families have some ability to steer their trajectory, Elder cautions that "not even great talent and industry can ensure life success over adversity without opportunities" (1998, p. 9). Considering that low-income families have few opportunities to begin with, it is clear that the birth of a disabled child would further limit the family's chances to succeed.

Within disability literature, models of disability provide frameworks for understanding both the causes of disability and the means to rectify them (Bricout, Porterfield, Tracey, & Howard, 2003). Contrary to the predominant medical model, the social model of disability suggests that impairment is not physically created but rather socially created by a non-accommodating social

environment (Chappell, Goodley & Lawthom, 2001; Bickenbach, Chatterji, Badley, & Ustun 1999). Advocates of the social model further contend that disability cannot be understood outside its social context in which people with disabilities are isolated and stigmatized (Bricout et al., 2003; Marks, 1997) and that society has an obligation both to include and assist all its members in achieving a high quality of life (Asch, 2001).

The social model has been criticized, however, for its dichotomous opposition to the medical model; for neglecting to acknowledge the bodily component of impairment and instead locating the source of disablement solely within the individual's social environment (e.g., Williams, 2001; Bricout et al., 2003). However, the model exhibits considerable utility as a lens framework for viewing the impact the birth of a disabled child has on a family. Although the social model is typically used in reference to adults with disabilities, a general/liberal application produces a lens through which to analyze the family unit of a child with a disability. Employed thus, the social model suggests that the family's environment—from immediate supports and resources to broader social and economic policy—is what truly determines how "disabled" the whole family unit of a disabled child will be. The social model suggests that the disabled person's limitations are the result of living in a society designed, both physically and psychologically, with the characteristics and needs of a non-disabled majority in mind (Asch, 2001), and we suggest here that the same is true for the entire *family* of a disabled child.

Research in this area is limited. However, the one study that applied the social model to the families of children with disabilities found that the whole family of a disabled child experienced a range of inequalities that families without disabled children do not suffer (Dowling & Dolan, 2001). Results of this study indicated that families of children with disabilities encountered problems with obtaining services, appointments and transportation, finding jobs that fit around child care responsibilities, and increased child-related expenses. Further, subjects identified "missed experiences" (e.g., going to the park, movies, and restaurants) which were generally avoided for fear of public disapproval or disruption (Dowling & Dolan, 2001). This typifies what Bickenbach et al. (1999) consider the salient feature of the inequalities experienced by people with disabilities: limitations on the freedom to participate in a full range of social activities and ways of living. These results further support Elder's (1998) concept of linked lives which draws attention to the interrelatedness of partners' or spouses' and children's life courses, suggesting that the misfortune of one family member is shared by the rest of the family unit through their "linked" fates (Elder, 1998).

The whole family economic impact of the birth of a child with disabilities is clearly linked with family structure. Although some research suggests that level of disability and family structure may not be as important as other factors (e.g., family income, social support system) in determining the family's ability to adapt to a challenge or crisis (Ferguson, 2001), family structure is strongly associated with family income and may be linked with social support systems. A priori, we would expect the impact of a child with disabilities to be larger for births to *single-mother* families given that such families have historically been more reliant on public welfare and had fewer private sources of psychological and financial support than married-couple families.

In the current study we hypothesize that 1) the birth of a disabled child is associated with a lower economic status for the family, 2) the effect of a disabled child on family economic status is larger for single-mother families, and 3) welfare (AFDC/TANF, food stamps, or SSI) use is higher among families with children with disabilities.

Data and Methods

Data

Data for this study were drawn from the 1979 National Longitudinal Survey of Youth (NLSY79), including the NLSY79 Child and Youth Supplement. The NLSY79 began in 1979 with a survey of a nationally representative sample of 6,111 civilian youth and a supplemental sample of 5,295 blacks, Hispanics, and economically disadvantaged non-blacks and non-Hispanics, all aged 14-21. This cohort of men and women were re-interviewed each year through 1994 and every other year after 1994.[1] This paper uses data collected through the 1998 survey year.

Starting in 1986, the children of all female NLSY79 respondents have been included in the Child and Youth Supplement (Bureau of Labor Statistics, 2001). Data for each child for whom the 1994 or 1998 Developmental questions were completed were linked with their birth mother's data in the main survey of the NLSY79.

The analysis presented here was conducted using a longitudinal sample of all women with children drawn from the combined NLSY79. This full sample is used to examine the average post-birth impact of children with disabilities on family income status. A pre-birth sub-sample of the longitudinal data allows identification and comparison of families who will have a child with disabilities prior to that child's birth.[2] In addition, we reconfigure the sample to look at the impact of up to the first three births for each mother (all births if the mother has less than three children). Three cross-sectional samples are also drawn from the combined NLSY79 to provide a descriptive look at the family and its characteristics, including economic status, both prior to and in two periods of time after the birth of the first child.

We limited our sample to women who had children and who were between the ages of 19 and 40, inclusive, in the year their first child was born. This reduced the likelihood that the mother was still living with her parents and allowed more accurate measurement of pre-birth family income. At the upper limit this reduced the likelihood that mother's age would influence the disability status of the child.

Variables

The dependent variables in the analysis are dichotomous, indicating whether family income is above or below some percentage of the poverty line, given family size and year.[3] Three separate dependent variables are estimated: below 100% of the poverty line on an annual basis, below 150% of the poverty line, and below 200% of the poverty line. Although the poverty line is somewhat arbitrary, use of this series of dichotomous variables should provide a more stable

indicator of relative family income status over time than would use of reported annual family income before taxes.

We also estimate the probability of welfare use to see if family use of AFDC/TANF, food stamps, or SSI is significantly different in families with children with disabilities. This dependent variable is also dichotomous, indicating whether or not the family used any of these programs during the survey year.

The independent variable of interest is child disability. Children in the NLSY were coded as having a disability if their mother indicated any one or more of the following conditions: allergies or asthma (only if children were on medication, under the care of a doctor, and were unable to participate in normal children's activities), attention deficit (hyperactivity) disorder (only if children were on medication, under the care of a doctor, and were unable to do regular schoolwork), blood disorder or immune deficiency, learning disability, serious speech impairment, serious hearing difficulty or deafness, serious seeing difficulty or blindness, serious emotional disturbance, physical disability, mental retardation, heart trouble, chronic nervous disorder, chronic ear infections, or seizure disorder. In 1998, 20.1% of families with children in the NLSY79 had at least one child with disabilities. While this is slightly above the figure cited by Newacheck et al. (1998), it is important to note that his criteria included increased use of health services. Some children with disabilities may simply require more parental and educational resources, rather than more health services.

The independent variable NDISABKIDS is set equal to the number of children with disabilities in the family during each survey year. The value of this variable ranges from 0 to 4. A significant and positive coefficient on NDISABKIDS would indicate that families are more likely to fall below the income level indicated by the dependent variable as the number of children with disabilities increases. A related independent variable, DISABKID, is used in the pre-birth and first three births samples. A significant and positive estimated coefficient on DISABKID would indicate that families who will have children with disabilities are more likely to fall below the income level indicated by the dependent variable in each year observed. This is tantamount to the result that children with disabilities are born into poor families.

To look at the effect of time, we include four independent dichotomous variables. BIRTHYEAR is set equal to 1 if the observation is from the year in which a child was born and 0 otherwise. EARLYYRS is set equal to 1 if the observation is from the first 5 years following the birth of the child (first child only in Table 3) in the family and 0 otherwise. LATERYRS is set equal to 1 if the observation is from the sixth or following post-first birth years and 0 otherwise (again, first child only in Table 3). A significant and positive coefficient on either of these time period variables would indicate that in the period following the birth of this child families were more likely to fall below the income level indicated by the dependent variable than they were during the pre-birth period (when they had no children). BIRTHYEAR is similarly interpreted, but for the birth year relative to the years in which no new child was born into the family.

Many of the families in the sample have children without disabilities over the time they are observed. To capture the average effect of each nondisabled child born into the family, a continuous variable reflecting the simple count of the number of children who are not diagnosed

with anything (NNDAKIDS) is included in the models. This variable increases in value as nondisabled children are born into the family. We expect this variable to have a positive impact on the probability of low-income for the family, but to be smaller than the impact of a child with disabilities (NDISABKIDS). The difference between the coefficients on NDISABKIDS and NNDAKIDS provides an estimate of the average differential impact each child with disabilities has on the economic status of their family. A positive difference (NDISABKIDS-NNDAKIDS > 0), provides evidence that families become poor after having children with disabilities. Similar variables, NNDASIBS and NDISABSIBS, are included in the models estimated for the first three births (Table 6). These models also include indicator variables for birth order with CHILD 2 and CHILD 3 equal to 1 if the child is the second or third born, respectively, and 0 otherwise. An indicator variable for the first-born child is omitted.

In addition, in the models for the first three births we interact EARLYYRS and LATERYRS with DISABKID. By doing so, we can identify the differential effect of children with disabilities on family income status, holding other included variables (principally mother's characteristics) constant. The coefficients on EARLYYRS*DISABKID and LATERYRS*DISABKID provide the "difference-in-difference" estimate of the effect. Positive and significant estimated coefficients on these variables indicate that post-birth (but not pre-birth), families with children with disabilities are relatively more likely to have experienced reduced incomes than families with children without disabilities. We also interact EARLYYRS and LATERYRS with SINGLE MOM in these models. This allows us to test whether single-mother families have a more difficult time adjusting financially to the birth of children. Positive and significant coefficient on these variables indicate that single-mother families are more likely to experience reduced incomes in the indicated post-birth than are married-couple families.

Other independent variables measure pre- and post-birth characteristics of mothers, and include mother's age at birth, mother's level of education (measured by years of schooling completed), and mother's race and ethnicity (assumed to be the same as the child's). Note that single-mothers are more likely to give birth to a child with disabilities than are married mothers (Table 1), a factor that may contribute to the increased risk of poverty for children with disabilities.

Methods

Given the longitudinal nature of the data and a desire the retain as much information about each family as possible in the model, a binomial logit model is estimated using a generalized estimating equations (GEE) procedure (see Allison,1999, for an explanation of this model). The GEE procedure both incorporates the time trend within the data set and estimates robust standard errors using the White (1990, as cited in Allison, 1999) correction. Specifically we estimate the impact of the birth of the each child on family income status by looking across time at the births of children with disabilities to each mother, controlling for births of children without disabilities, mom's level of education, her age the year she first gave birth, and her race and ethnicity.

In the analysis, we also compare income status in families who (will) have a child with disabilities—the treatment group—and income status in families who (will) have a child without disabilities—a comparison group—for both the pre- and post-birth years. In the literature, this has approach has been referred to as a "difference-in-difference" analysis (Stock & Watson,

2003). While the difference-in-difference approach has been used primarily to look at the impacts of changes in government policies and programs, it does appear to be applicable to the analysis of life-events, such as childbirth, as well. In both cases, there is a definable point of change in the circumstances in which individuals or families find themselves, and this change in circumstances is not transient or short term.

This approach is not without limitations. Researchers have pointed out that a variety of factors may have changed and influenced the key outcome, apart from variable of interest. For instance, macroeconomic conditions may have differed between pre- and post-birth periods (Moffitt & Ver Ploeg, 2001; Porterfield & Winkler, 2003). In the analysis conducted here, we specifically address this by controlling for year so that the effect of having a child with disabilities is "net" of this factor.

In the case of GEE logistic regression, the estimated coefficients must be transformed to obtain quantitative estimates of the employment effects.[4] Nonetheless, the logistic coefficients reported in the tables that follow provide useful information about the direction (positive or negative) and significance of the effects. In additional tables and the text, we also report quantitative effects based on these results.

In addition, in order to capture impacts of child disability in pre- and post-birth, we report descriptive statistics for three cross-sectional samples: the year prior to the child's birth, three years after the child's birth, and six years after the child's birth. By three years post-birth most childhood disabilities would be identified. By six years post-birth the family will have had time to adjust to having children and the children (with and without disabilities) will have entered school, freeing some of their caregiver's time.

Results

Descriptive statistics are shown in Tables 1 and 2. Single-mother families differ significantly from married-couple families in nearly every descriptive category in Table 1. Single mothers are more likely to be women of color, have greatly reduced incomes, are more likely to receive public assistance, and are less likely to be home owners than are married mothers. Single mothers are less likely to work full time prior to the birth of their first child, but are more likely than married mothers to work full time after the birth of their first child and work significantly more hours in post-birth years, on average, than do married mothers. Single-mother families are significantly more likely than married-couple families to have children with disabilities. However among those families with children with disabilities there is no significant difference in the number of children with and without disabilities in the family (Table 2, rows showing births per mother).

Single-mother families with children with disabilities are significantly more likely to have incomes below 150% of poverty three years after the birth of their first child than are single mothers who never given birth to a child with disabilities (Table 2). However by six years after the birth of the first child, single-mother families with children with disabilities appear to have recovered from the initial financial shock of children. Among single-mother families, work status and hours are not significantly different for moms who have children with versus without

disabilities (Table 2, section on work status and hours). Within both groups of single-mother families, a significant share of moms dropped out of the labor force altogether after the first birth (similar to what we observe among married mothers). Only a small proportion of single mothers have a male partner who works, and single mothers with children with disabilities are only half as likely to have a male partner who works full time as are single mothers without children with disabilities. A significant decline also occurred in the percent of single mothers working part time and a significant increase occurred in the percent using welfare (AFDC/TANF, food stamps, or SSI) after the birth of their first child. The reported increase in the proportion of single mothers who gave birth to a child with disabilities who are working full time is interesting, but not significantly different from other single mothers.

Somewhat different patterns are seen in Table 2 among married-couple families, a far smaller proportion who have incomes below 150 percent of poverty. Married-couple families with children without disabilities are significantly less likely to have incomes below 200 percent of poverty than are married couple families with children with disabilities. They are also less likely to have incomes between 150 and 200 percent of poverty. This may be at least partly because of differences in work hours. Among both types of married-couple families as mom reduced her work hours post-birth, dad increased his. However as found in earlier research (discussed in the literature review above), married moms with children with disabilities are significantly less likely to work, and especially to work full time than are moms with non-disabled children.

Unlike single-mother families, married-couple families don't appear to recover economically even 6 years after the birth of their first child (Table 2). Note that this may have longer-term implications for asset accumulation. Not only do married-couple families with children with disabilities have lower annual earned income than other married-couple families, but they appear less likely to be homeowners as well (bottom of Table 2). Three-quarters of married-couple families without children with disabilities own their own home within 6 years of the birth of their first child, significantly higher than the less than two-thirds of married-couple families with children with disabilities who own their homes. A far smaller proportion of single-mother families own their homes and homeownership rates are nearly identical whether or not single mothers have children with disabilities.

Table 3 shows GEE (binomial, logistic) regression results for six models. Estimated equations in Table 3 use as dependent variable whether family income is above (dependent variable = 0) or below (dependent variable = 1) 100%, 150%, or 200% of poverty, respectively. In each of the equations BIRTHYEAR is negative and significant (except at 100 percent of poverty), indicating that family incomes are significantly higher during the birth year than during years in which the mother did not experience a birth. All families have lower economic status in the first six years after their first child is born (EARLYYR coefficient is positive and significant in each equation) and for most this carries over into years after the first-born child reaches school age (LATERYR is positive and significant at 150% and 200% of poverty). Single-mother families have a differential impact in both the earlier and later years and are more likely than married-couple families to fall below 200% of poverty (positive and significant coefficients on the interaction variables EARLYYR*SINGLE MOM and LATERYR*SINGLE MOM at 200% of poverty). For each dependent variable, single-mother families are more likely to fall below the poverty level indicated (coefficients on SINGLE MOM are positive and significant in each model).

Single-mother families are nearly 7 times more likely than married couple families to fall below 100% of poverty, 5 times more likely to fall below 150% of poverty, and 3.7 times more likely to fall below 200% of poverty (odds ratios in each model). In each model the coefficients on NDISABKIDS are also positive and significant, indicating that families with children with disabilities have significantly lower incomes after the birth of the child(ren) with disabilities. Non-disabled children also increase the probability of lower incomes (NNDAKIDS is positive and significant in each equation), but to a lesser extent (smaller coefficients) than children with disabilities. As expected, mom's education level and age at the birth of the first child mediate the economic effects of childbirth, and non-whites are more likely to fall below the level of poverty measured in each model.

Results from the GEE estimation of the pre-birth sample are shown in Table 4. Once mother's characteristics are controlled for no significant differences are seen in the pre-birth economic status of women who will have children with disabilities compared with those who will not. This suggests that families become poor or have reduced income after the birth of a child with disabilities. However, note that women who are going to have children with disabilities are significantly more likely to live in households that receive some form of welfare (AFDC/TANF, SSI, or food stamps) prior to the child's birth. This suggests that family or household characteristics may impact the disability status of the child, though income pre-birth isn't significantly associated with later child disability.

Our primary interest is in examining whether children with disabilities have a differential and negative impact on family economic status. This differential impact can be measured using results from both the full longitudinal file (Table 3) and the pre-birth sample (Table 4). This indicates that children with disabilities, on average, do indeed have a differential and negative impact on family economic status. The size of this differential, relative to the negative impact of children without disabilities, can be seen in Table 5. For both single-mother and married-couple families, the percentage point increase in the probability of family income below 100%, 150%, or 200% of poverty associated with having a child with disabilities is small. In the pre-birth period, families who will have a child with disabilities have a somewhat higher probability of being in the lower-income categories, though keep in mind that these differences are within the confidence interval for both single-mother and married-couple families (so differences are not statistically significant). However the results suggest that children with disabilities also have a larger negative impact on family income than do children without disabilities. For example, as a single-mother family moves from the pre-birth to the post-birth period, their probability of falling below the poverty level increases by about 2.2 percentage points if they have one non-disabled child and by 4.8 percentage points if they have one child with a disability. Results for the probability of falling below 150 percent and 200 percent of poverty show the same pattern for single-mother families. A similar pattern is observed for married-couple families though there is a very small risk of poverty among these families, whether or not they have a child with disabilities. Results in Table 5 indicate that the increased risk of poverty among families with children with disabilities is partly due to differential characteristics of the family (primarily whether the mother is single or married) and partly due to the birth of the child with disabilities.

Table 6 looks more closely at each of the first three births (or all births if the mother has less than three children) for each mother. All families are more likely to experience an increased risk of

lower incomes in the early years following the birth of each child (coefficients on EARLYYRS are positive and significant in each model). In later years, families are at risk of falling below 150 percent of poverty, but at no increased risk of falling below the poverty line. The coefficient on DISABKID is not significant. This corresponds with results reported in Table 4 for the pre-birth period. However, the coefficients on interaction variables EARLYYRS*DISABKID and LATERYRS*DISABKID are positive and significant for the model estimating the probability of falling below 200 percent of poverty, indicating that families with disabled children are more likely to fall below 200 percent of poverty after the birth of their child with disabilities than before and also indicating that the financial impact of the child with disabilities actually increases after the child reaches school age (coefficient on LATERYRS*DISABKID is much larger than the coefficient on EARLYYRS*DISABKID). Children with disabilities appear to also have a differential impact on the economic status of single-mother families at higher incomes, increasing the probability that these families will fall below 200 percent of poverty in both the early and later years of the post-birth period (positive and significant coefficients on the interaction variables and again a much larger coefficient on the LATERYRS*DISABKID interaction). This suggests a longer adjustment process for relatively higher-income single-mother families with children with disabilities than for married-couple families with children with disabilities or for families without children with disabilities.

As expected, each successive child in a family has a positive and increasing impact on the likelihood that the family will fall below the economic status defined by the dependent variables (positive and significant coefficients on CHILD2 and CHILD3). Similarly, the number of siblings with and without disabilities increases the likelihood of lower family income, with the number of siblings with disabilities having the larger effect. These effects are computed as cumulative probabilities and shown in Table 7.

Table 7 summarizes the results from the logistic regression models for the first three births by estimating the probability that the family faces economic hardship, given their characteristics and the estimated coefficients. Probabilities in Table 7 differ slightly from those in Table 5 because they allow for the impact of child birth order and also are computed only for the early years post-birth. For all families, having a child with disabilities increases the probability of lowered income, though not substantially more than having children without disabilities. Results suggest that birth order may matter and that the family adjusts to their circumstances over time. For example, a first child with disabilities followed by a second child without disabilities (scenario 5) has a somewhat smaller impact on family income in some cases than a first child without disabilities followed by a second child with disabilities (scenario 4). In scenario 5 families have had time to adjust to the child with disabilities; in scenario 4 the child with disabilities is still a preschooler.

For single-mother families, the birth of the second non-disabled child has the greatest additive impact on the probability of lower family income. For example, the birth of the first non-disabled child (scenario 1) increases the probability of family income below the poverty level from 25.6% to 29.7%, an increase of 16.2%. Adding a second non-disabled child (scenario 3) increases the probability by another 45.1% and adding a third non-disabled child (scenario 5) increases the probability another 25.3%. For married-couple families, the birth of the third child greatly increases the probability that family income will fall below the specified level,

particularly if the third child has a disability. This result corresponds closely with recent research on child poverty in Europe (Cantillon & Van den Bosch, 2002).

The impact of child disability on family welfare use (defined as use of AFDC/TANF, food stamps, or SSI at some point in a given year) is shown in Table 8. Not surprisingly, the probability of family welfare use increases tremendously after the birth of their first child, with single-mother families 8.6 times as likely and married-couple families 2.6 times as likely (odds ratios) to use welfare after the birth of their first child than before. The number of children significantly impacts the probability of welfare use. Each child without disabilities increases the probability of welfare use by about 60 percent while each child with disabilities more than doubles the probability of welfare use for both single-mother and married-couple families.

Summary and Limitations

Three hypotheses were stated earlier. The first, that the birth of a disabled child is associated with a lower economic status for the family does appear to hold. The average impact of a child with disabilities compared with a child without disabilities is measured by the size of the coefficients on the variables NDISABKIDS and NNDAKIDS in Table 3 and the variables NDISABSIBS and NNDASIBS in Table 6. In addition, although the estimated coefficient on DISABKID in Table 6 is not significant, children with disabilities are significantly more likely to live in families with incomes below 200 percent of poverty in both the early and later post-birth years (positive and significant coefficients on EARLYYRS*DISABKID and LATERYRS*DISABKID in Table 6). The second, that the effect of a disabled child on family economic status is larger for single-mother families, is difficult to measure as family structure changes over time. Clearly single-mother families are at greater risk of falling into poverty than married-couple families, and in the descriptive statistics we observe a significantly higher risk of falling below 150 percent of poverty among single-mother families when observed three years post-birth of their first child. This difference in risk disappears by the 6th year post-birth (Table 2). The third, that welfare (AFDC/TANF, food stamps, or SSI) use is higher among families with children with disabilities does hold as shown in Table 8 where the risk of using welfare is effectively double for the family with has a child with disabilities than for the family with a nondisabled child.

This study begins to answer questions concerning the causal relationship between child disability and family income level. Results suggest that causality may be mixed. Descriptive statistics show that children with disabilities are more likely to be born to single-mother families and single-mother families are far more likely than married-couple families to live in poverty. However in the multivariate analysis there is no indication of significant pre-birth differences between families who are going to have a child with disabilities versus those who are not. Results from the multivariate analyses do indicate a significant difference in post-birth income status among families with children with disabilities compared with families with nondisabled children.

This study examines all families as single-mother or married-couple, accounting for mothers who divorced or married during the study period, but not accounting for the impact of marital status on the probability of both being in poverty and having a child with a disability. Divorce is

a major risk factor for poverty among single-mother families and children with disabilities are more likely to experience a divorce between their parents (Mauldon, 1992). In addition, women who have children with disabilities as single parents appear less likely to have spouse-like partners and may be less likely to marry as well. Both these findings indicate that causality between single parenthood and child disability may warrant more exploration.

Implications and Further Research

The economic adjustment that families appear to make between the early and the later years post-birth suggests that school-based support services may be making some difference for married-couple families, even if only providing a safe place for the child for several hours per day. Single-mother families may not be as helped by school-based support services, possibly because they have less knowledge of services to request or possibly because there are too many service gaps (days off during the school year and summer holidays) and too few service providers for older children to facilitate a full-time job for mom. School-based services, if tailored to the needs of the child, have the potential to significantly improve not only the welfare of the child with disabilities, but that of their family members and the communities in which they live as well. To the extent that other social risks also follow from the increased risk of poverty in families with disabled children (such as divorce and involvement with the child welfare system), effective policy intervention may lead to other social improvements as well.

Single-mother families with children with disabilities do not exhibit the same adjustment path, particularly in the later years post-birth, as married-couple families. While having school-age children with disabilities may free mom from her role as caregiver, the school day averages just under six hours in length (NCES, 1998). For mothers who receive income from the TANF program, this is not congruent with the requirement to work a minimum of 30 hours per week if one assumes some commuting time and an unpaid lunch break (Ohlson, 1998). Appropriate after-school care for children with disabilities can be difficult to find, particularly once children move from elementary to middle school, and may be quite costly (Kagen, Lewis, Heaton, & Cranshaw, 1999). Single-mother families at risk of poverty and public assistance receipt need more than just the respite time offered by public schools (Ward, 1999). At the very least they will need help with or training in case management, guidance or information concerning available resources that meet their child's specific needs (Gammon & Rose, 1991), and likely either a longer time period for TANF receipt or a switch to a more appropriate social welfare program (Ohlson, 1998).

While we do not know the exact expenses associated with care for a child with disabilities, it is clear from the literature that these expenses (including out-of-pocket payments) are higher than those for children without disabilities (Lukemeyer et al., 2000; Perrin et al., 2002). Some government policies and programs help families bear the burden of these increased expenses, but many of these programs are not amenable to use by lower-income families. For example, unreimbursed medical expenses can be taken as a credit against taxes owed, but only the amount that exceeds 7.5% of adjusted gross income (AGI). For the family whose income is low enough not to owe taxes, or not to owe much in taxes, this credit may not be helpful.

In conjunction with the medical expenses tax credit, many families have access to employer "cafeteria" plans (Section 125 plans), allowing working parents to pay some portion of out-of-pocket medical expenses on a pre-tax basis (often the 7.5% of AGI that is not tax-deductible). While these plans are beneficial, they are only available if offered by the employer. Low-income workers tend to work for small employers and small employers tend not to offer Section 125 plans as part of their benefits package (BLS, 1998, 1999). These plans are optional for the employee as well and they appear to mainly benefit workers with higher levels of education (Feldman & Schultz, 2001).

Anecdotal evidence suggests that many families with children with disabilities purposely keep their incomes low in order for their child to qualify for health insurance coverage under either the Medicaid program or one of the State Children's Health Insurance programs (Bazelon Center, 2002). This occurs mainly in states without TEFRA or Section 1915(c) Medicaid waivers (so-called "Katie Beckett" waivers) that allow children with disabilities to qualify for Medicaid under their own (rather than their parents) income provided they have severe disabilities, need skilled medical care, and can be cared for less expensively at home than in an institutional setting. Certainly an expansion of these waivers to all states should be a policy priority. Keeping children eligible for Medicaid and other public programs may be partly why results from this study show children with disabilities having a differential and longer-term impact on family incomes only when incomes are close to 200% of poverty.

For all families, the birth of the third child is associated with a significant increase in the risk of lower income. This suggests that a third bracket for the Earned Income Credit, designed for families with three or more children, would be helpful in reducing the poverty rate among these families. Fully 40% of single-mother families with children with disabilities included in this study have more than two children, while only 17% have more than three children. Similarly, 36% of married-couple families with children with disabilities have more than two children, while less than 6 percent have more than three children.

The Earned Income Credit is perhaps the policy vehicle most suited to helping families with children with disabilities. If a family's average out-of-pocket expenditures per child with disabilities could be computed using available government data sources (such as the Medical Expenditure Panel Survey, the National Health Interview Survey, or the Consumer Expenditure Survey), a credit supplement for excessive child medical expenses could be added to the Earned Income Credit. The supplement could vary by broad disability or chronic illness category. Families could choose between taking this EIC medical credit, using their employer's Section 125 cafeteria plan if available, or taking the traditional tax form-based medical expense tax credit.

We characterize this study as a beginning because it does have limitations. While results suggest that the birth of a child with disabilities is the catalyst that lowers family income, single-mother families are already at significant risk of poverty and welfare receipt. We know little from this research about the reasons why children with disabilities impact family income. Certainly we know that mothers are more likely to cut back on work hours even when children enter school (Porterfield, 2002), but do fathers and mothers also choose less time-consuming and therefore lower-paying jobs after the birth of their child with disabilities as suggested by qualitative

research (Freedman, Litchfield, & Warfield, 1995)? What role does the type of disability or chronic illness play?

More research is needed to explore whether or not single-mother families whose financial situation worsens following the birth of a child with disabilities recover economically after a period of time. Future research should also focus on using other measure of family economic status (e.g., levels of assets such as home ownership and pension funds) to illuminate the full economic impact of the birth of a child with disabilities. Findings from the present study also bring to light the lack of research comparing the impact of a child with disabilities by disability type or severity of functional limitations. Certainly some disabilities are more time- or money-intensive. Identification of these more "costly" disabilities would help target use of scarce public resources both for family income assistance and for medical research.

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Table 1. Mean Values for Pre- and Post-Birth Cross-Sectional Samples.

	1 Year Pre-Birth		*3 Years Post-Birth*		*6 Years Post-Birth*	
	Single-Mother	Married-Couple	Single-Mother	Married-Couple	Single-Mother	Married-Couple
Percent of Sample	47.3	52.7	29.6	70.4	32.4	67.6
Births Per Mother						
Percent who have or will have Disabled Children	13.3	10.0**	15.6	11.1**	19.3	13.2***
Children with Disabilities	-	-	0.18	0.13**	0.23	0.18*
Children without Disabilities	-	-	1.10	1.43***	1.33	1.81***
Race and Ethnicity						
Hispanic	8.2	4.2***	9.1	5.0***	8.3	5.4**
Black	20.3	4.4***	31.0	6.2***	27.4	6.1***
White	75.2	93.5***	64.5	91.3***	66.6	91.3***
Other Race	3.9	1.6***	4.0	2.1**	4.6	2.3**
Characteristics of Mothers						
Age at child's birth	24.1	26.7***	23.8	25.5***	23.2	24.8***
Years of School	12.5	13.8***	12.6	13.5***	12.6	13.4***
Family Income Status						
< 100% of Poverty	24.1	1.6***	37.9	3.9***	33.0	4.6***
< 150% of Poverty	36.6	4.2***	50.0	9.4***	45.1	10.0***
< 200% of Poverty	50.1	8.1***	65.1	19.6***	61.2	20.2***
100-150% of Poverty	12.5	2.6***	12.1	5.5***	12.1	5.4***
150-200% of Poverty	12.3	3.8***	10.5	9.7	12.4	9.9
>200% of Poverty	50.0	92.0***	35.0	80.5***	38.8	79.8***
Work Status and Hours						
Mother						
Does not work	7.8	4.0***	23.7	25.6	24.1	25.4
Works part time	45.7	30.4***	34.9	39.0	31.0	37.6**
Works full time	45.8	64.0***	41.3	34.2**	42.3	35.4**
Avg Annual Hours	1428	1753	1187	1068**	1269	1117***
Husband/Male Partner						
Does not work	0.0	0.7	1.6	0.5**	0.5	1.2
Works part time	0.6	15.2	4.3	11.3***	2.4	8.5***
Works full time	2.9	81.8	15.6	86.1***	16.7	87.4***
Avg Annual Hours	1998	2130	1888	2222***	2051	2256**
Welfare Receipt						
AFDC & food stamps	4.4	1.2***	41.5	5.2***	35.2	3.9***
AFDC, food stamps, & SSI	5.0	1.6***	42.9	5.5***	37.5	4.2***
Home Owners	6.2	53.0***	12.5	66.9***	16.7	73.8***
Sample Size	920	1025	545	1246	482	1004

Notes: Weighted percentages are shown.
* significantly different from single-mother families at the 10% level; ** 5% level; *** 1% level

Table 2. Income Status and Family Characteristics 1Year Pre-Birth and 3 and 6 Years Post-Birth.

	One or More Children have Disabilities						*No Children have Disabilities*					
	Single-Mother			Married-Couple			Single-Mother			Married-Couple		
	1 Yr Pre	*3 Post*	*6 Post*	*1 Yr Pre*	*3 Post*	*6 Post*	*1 Yr Pre*	*3 Post*	*6 Post*	*1 Yr Pre*	*3 Post*	*6 Post*
Income Status												
<100% of Poverty	23.5	47.6	33.8	1.4	5.9	3.8	24.1	36.1**	32.8	1.6	3.7	4.8
<150% of Poverty	38.1	59.5	46.0	4.3	10.2	13.8	36.3	48.3*	44.9	4.2	9.3	9.4
<200% of Poverty	53.5	70.1	66.4	9.2	26.0	27.2	49.6	64.2	60.0	8.0	18.8**	19.1**
100-150% of Poverty	14.6	11.9	12.1	2.8	4.3	10.0	12.2	12.2	12.1	2.6	5.6	4.6**
150-200% of Poverty	12.7	7.4	16.1	5.0	14.9	13.4	12.2	11.0	11.5	3.6	9.0**	9.4
>200% of Poverty	46.5	30.0	33.6	90.8	73.9	72.8	51.3	35.7	40.0	92.1	79.9*	81.2**
Births per mother												
Children with Disabilities	-	1.18	1.20	-	1.21	1.33	-	-	-	-	-	-
Children without Disabilities	-	0.23	0.57	-	0.32	0.70	-	1.26***	1.51***	-	1.56***	1.98***
Race and Ethnicity												
Hispanic	4.7	7.6	5.8	4.3	4.0	4.8	8.7	9.4	8.9	4.2	5.1	5.5
Black	21.2	31.8	25.1	5.0	6.7	7.6	20.2	37.5	28.0	4.4	6.1	5.8
White	73.7	65.2	66.3	93.5	91.5	90.0	75.4	60.5	66.6	93.5	91.5	91.4
Other Race	5.1	7.7	8.7	1.5	1.9	2.4	3.7	3.3*	3.7**	1.6	2.1	2.3
Characteristics of Mother												
Age at first child's birth	24.1	23.5	22.7	26.4	25.2	24.4	24.1	23.8	23.3	26.7	25.5	24.9
Years of schooling	12.5	12.6	12.4	13.9	13.5	13.3	12.5	12.6	12.7	13.8	13.5	13.4
Work Status and Hours												
Mother												
Does not work	6.7	24.9	26.9	3.6	40.6	29.0	8.0	23.5	23.5	4.0	23.7***	24.9
Works part time	49.5	37.6	27.7	32.7	28.1	42.3	45.1	34.4	31.8	30.1	40.3***	36.9
Works full time	43.6	37.5	45.4	61.8	31.3	27.2	46.1	42.0	41.6	64.2	34.6	36.6**
Avg Annual Hours	1387	1116	1229	1725	913	998	1435	1200	1278	1756	1088**	1135
Husband/Male Partner												
Does not work	0.0	2.9	2.3	1.1	0.0	1.3	0.0	1.4	0.0***	0.7	0.6	1.2
Works part time	2.9	3.6	2.0	10.3	11.0	8.4	0.3	4.4	2.5	15.7	11.3	8.5
Works full time	2.6	7.7	9.3	8.6	86.7	87.7	2.9	17.1**	18.4**	81.3	86.0	87.4
Avg Annual Hours	1314	1456	2090	2089	2268	2270	2194	1937	2044	2134	2216	2254
Welfare Use												
AFDC & food stamps	10.1	45.3	33.2	2.4	4.4	4.3	3.5	40.8	35.7	1.2	5.3	3.9
AFDC, food stamps, & SSI	10.4	47.6	37.2	2.4	4.8	5.5	4.2	42.0	37.5	1.5	5.6	4.0
Home Owners	9.9	11.2	16.0	47.1	63.8	63.9	5.6	12.8	16.9	53.7	67.3	75.2**
Sample size	112	77	81	101	134	134	808	448	401	924	1112	870

Notes: Weighted percentages are shown. * significantly different from families with children with disabilities at the 10% level; ** 5% level; *** 1% level

Table 3. GEE (Logistic) Model of Family Income Status.

	100% of Poverty		*150% of Poverty*		*200% of Poverty*	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio	Coefficient	Odds Ratio
BIRTH YEAR	-0.071		-0.103**	0.902	-0.131***	0.877
	(0.052)		(0.042)		(0.038)	
EARLYYR	0.245**	1.277	0.393***	1.481	0.437***	1.548
	(0.101)		(0.075)		(0.064)	
LATERYR	0.110		0.285**	1.329	0.323***	1.381
	(0.141)		(0.111)		(0.092)	
SINGLE MOM	1.938***	6.944	1.609***	4.997	1.296***	3.654
	(0.090)		(0.070)		(0.061)	
EARLYYR* SINGLE MOM	0.026		-0.064		0.141*	1.151
	(0.111)		(0.088)		(0.083)	
LATERYR* SINGLE MOM	0.026		0.025		0.261***	1.298
	(0.131)		(0.103)		(0.093)	
NDISABKIDS	0.647***	1.909	0.639***	1.894	0.680***	1.973
	(0.083)		(0.072)		(0.071)	
NNDAKIDS	0.471***	1.601	0.441***	1.554	0.476***	1.609
	(0.047)		(0.040)		(0.038)	
MOM YEARS OF EDUC	-0.236***	0.789	-0.247***	0.781	-0.250***	0.778
	(0.019)		(0.016)		(0.015)	
MOM AGE AT FIRST BIRTH	-0.035***	0.965	-0.043***	0.957	-0.051***	0.950
	(0.009)		(0.008)		(0.008)	
BLACK	0.973***	2.645	1.017***	2.764	1.008***	2.740
	(0.070)		(0.066)		(0.066)	
HISPANIC	0.472***	1.603	0.599***	1.820	0.550***	1.733
	(0.089)		(0.081)		(0.081)	
OTHER RACE	0.329**	1.389	0.263**	1.300	0.203	
	(0.136)		(0.128)		(0.132)	
INTERCEPT	-1.487***		-0.194		1.305***	
	(0.355)		(0.316)		(0.291)	
Model Controls For Year	Yes		Yes		Yes	
Log-Likelihood	-11681.29		-14643.22		-16816.55	

Number of observations = 32,454. Number of mothers = 2,114.
* estimated coefficient is significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.
Robust standard errors in parentheses.

Table 4. GEE (Logistic) Regression Results for Pre-Birth Periods.

	100% of Poverty		*150% of Poverty*		*200% of Poverty*		*Welfare Use*	
	Coefficient	Odds	Coefficient	Odds	Coefficient	Odds	Coefficient	Odds
DISABKID	0.044		0.132		0.167		0.654***	1.923
	(0.114)		(0.107)		(0.105)		(0.230)	
SINGLE MOM	2.116***	8.297	1.775***	5.900	1.510***	4.526	0.476**	1.609
	(0.118)		(0.089)		(0.074)		(0.197)	
MOM YEARS OF EDUC	-0.142***	0.867	-0.153***	0.858	-0.164***	0.848	-0.363***	0.695
	(0.024)		(0.021)		(0.019)		(0.052)	
MOM AGE AT FIRST BIRTH	-0.037***	0.963	-0.043***	0.957	-0.053***	0.948	0.081*	1.084
	(0.011)		(0.010)		(0.009)		(0.044)	
BLACK	0.989***	2.688	1.010***	2.745	1.096***	2.992	0.528***	1.695
	(0.084)		(0.081)		(0.083)		(0.195)	
HISPANIC	0.453***	1.573	0.588***	1.800	0.605***	1.831	-0.144	
	(0.107)		(0.098)		(0.095)		(0.259)	
OTHER RACE	0.325**	1.384	0.471***	1.601	0.451***	1.569	0.533*	1.704
	(0.149)		(0.149)		(0.148)		(0.319)	
INTERCEPT	-1.002		-0.202		0.597		-0.654	
	(0.619)		(0.589)		(0.539)		(1.401)	
Model Controls For Year	Yes		Yes		Yes		Yes	
Log-Likelihood	-5123.48		-6079.81		-6636.55		-1494.23	

Number of observations = 11,995. Number of mothers = 2032.
* estimated coefficient is significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level
Robust standard errors in parentheses.

Table 5. Probability Family Faces Economic Hardship, Full and Pre-Birth Samples.

	Probability Family Income is		
	<100% of Poverty	<150% of Poverty	<200% of Poverty
Single-Mother Families			
Baseline: Before Birth of Children			
Will have a child with disabilities	25.51	38.76	51.26
Will not have a child with disabilities	24.56	36.13	47.68
Baseline (pre-birth) difference	*0.95*	*2.63*	*3.58*
Alternative Scenarios: Post-Birth Years			
(1) One child with disabilities, No other children	33.58	49.88	68.20
(2) One non-disabled child, No other children	30.74	45.45	62.73
Post-birth difference	*2.84*	*4.43*	*5.47*
(3) One child with disabilities, One child without disabilities	44.74	59.60	76.87
(4) Two non-disabled children	41.55	55.25	72.28
(5) Two children with disabilities	47.97	63.80	80.90
Married-Couple Families			
Baseline: Before Birth of Children			
Will have a child with disabilities	2.12	7.04	12.93
Will not have a child with disabilities	1.33	4.02	11.24
Baseline (pre-birth) difference	*0.79*	*3.02*	*1.69*
Alternative Scenarios: Post-Birth Years			
(1) One child with disabilities, No other children	3.68	8.38	17.57
(2) One non-disabled child, No other children	2.69	6.56	14.99
Post-birth difference	*0.99*	*1.82*	*2.58*
(3) One child with disabilities, One child without disabilities	5.76	13.47	26.64
(4) Two non-disabled children	4.22	10.68	23.09
(5) Two children with disabilities	7.80	16.85	30.51

Table 6. GEE (Logistic) Regression Results for the First Three Children.

	<100% of Poverty		*<150% of Poverty*		*<200% of Poverty*	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio	Coefficient	Odds Ratio
BIRTHYEAR	-0.023		-0.039		-0.048	
	(0.055)		(0.044)		(0.041)	
EARLYYRS	0.169**	1.184	0.227***	1.254	0.306***	1.357
	(0.071)		(0.054)		(0.048)	
LATERYRS	0.086		0.169**	1.184	0.209***	1.232
	(0.100)		(0.078)		(0.068)	
DISABKID	0.085		0.102		0.068	
	(0.072)		(0.066)		(0.064)	
EARLYYRS* DISABKID	0.087		0.116		0.163**	1.177
	(0.092)		(0.077)		(0.075)	
LATERYRS* DISABKID	0.114		0.128		0.212**	1.236
	(0.119)		(0.105)		(0.096)	
SINGLE MOM	1.905***	6.719	1.498***	4.472	1.233***	3.431
	(0.053)		(0.041)		(0.038)	
EARLYYRS* SINGLE MOM	0.037		0.026		0.180***	1.197
	(0.068)		(0.056)		(0.056)	
LATERYRS* SINGLE MOM	0.017		0.043		0.253***	1.287
	(0.087)		(0.069)		(0.066)	
CHILD 2	0.134***	1.143	0.179***	1.196	0.222***	1.248
	(0.049)		(0.045)		(0.044)	
CHILD 3	0.375***	1.454	0.468***	1.596	0.575***	1.777
	(0.068)		(0.062)		(0.063)	
NDISABSIBS	0.582***	1.789	0.569***	1.766	0.560***	1.750
	(0.060)		(0.054)		(0.051)	
NNDASIBS	0.392***	1.479	0.359***	1.431	0.369***	1.446
	(0.029)		(0.024)		(0.024)	
MOM YEARS OF EDUC	-0.248***	0.780	-0.259***	0.771	-0.274***	0.760
	(0.012)		(0.010)		(0.010)	
MOM AGE AT FIRST BIRTH	-0.038***	0.962	-0.049***	0.952	-0.055***	0.946
	(0.006)		(0.005)		(0.005)	
BLACK	1.069***	2.912	1.121***	3.067	1.131***	3.098
	(0.048)		(0.045)		(0.046)	
HISPANIC	0.525***	1.690	0.631***	1.879	0.556***	1.743
	(0.059)		(0.055)		(0.055)	
OTHER RACE	0.323***	1.381	0.318***	1.374	0.269***	1.308
	(0.088)		(0.084)		(0.089)	
INTERCEPT	-0.846***		0.617***		2.364***	
	(0.239)		(0.211)		(0.200)	
Model Controls For Year	Yes		Yes		Yes	
Log-Likelihood	-25007.62		-31278.57		-35395.48	

Number of observations = 68,511; Number of children = 2,224.
* estimated coefficient is significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.
Robust standard errors in parentheses.

Table 7. Probability Family Faces Economic Hardship in the Early Years (Children ages 0-6): Impact of First Three Births.

	Probability Family Income is		
	<100% of Poverty	<150% of Poverty	<200% of Poverty
Single-Mother Families			
Baseline: Before Birth of Children	19.91	30.08	45.26
Alternative Scenarios: Post-Birth Years			
(1) First child has no disabilities	23.41	35.07	52.91
(2) First child has disabilities	26.66	40.19	58.62
(3) First two children have no disabilities	34.13	48.08	67.00
(4) First child has no disabilities followed by second child with disabilities	38.12	53.53	71.91
(5) First child has disabilities followed by second child without disabilities	38.52	53.33	71.08
(6) First two children have disabilities	42.69	58.71	75.61
(7) First three children have no disabilities	49.40	63.90	80.69
(8) First two children have no disabilities followed by third child with disabilities	53.71	68.77	84.05
Married-Couple Families			
Baseline: Before Birth of Children	3.57	8.56	16.74
Alternative Scenarios: Post-Birth Years			
(1) First child has no disabilities,	4.20	10.52	21.46
(2) First child has disabilities	4.95	12.76	25.62
(3) First two children have no disabilities	6.92	16.77	33.06
(4) First child has no disabilities followed by second child with disabilities	8.11	20.05	38.37
(5) First child has disabilities followed by second child without disabilities	8.24	19.92	37.42
(6) First two children have disabilities	9.65	23.63	42.99
(7) First three children have no disabilities	12.28	27.81	50.41
(8) First two children have no disabilities followed by third child with disabilities	14.26	32.40	56.18

Table 8. GEE (Logistic) Model of Family Welfare Use (AFDC/TANF, Food Stamps, or SSI).

	Full Sample		***Single-Mother Families***		***Married-Couple Families***	
	Coefficient	*Odds Ratio*	*Coefficient*	*Odds Ratio*	*Coefficient*	*Odds Ratio*
BIRTHYEAR	-0.033		0.113		-0.059	
	(0.052)		(0.080)		(0.097)	
EARLYYRS	0.767***	2.153	2.152***	8.602	0.960***	2.611
	(0.117)		(0.128)		(0.144)	
LATERYRS	0.765***	2.148				
	(0.149)					
SINGLE MOM	0.220*	1.246				
	(0.130)					
EARLYYRS* SINGLE MOM	1.298***	3.661				
	(0.143)					
LATERYRS* SINGLE MOM	1.191***	3.290				
	(0.149)					
NDISABKIDS	0.756***	2.129	0.784***	2.190	0.807***	2.241
	(0.092)		(0.118)		(0.071)	
NNDAKIDS	0.399***	1.490	0.451***	1.569	0.475***	1.608
	(0.049)		(0.062)		(0.045)	
MOM YEARS OF EDUC	-0.311***	0.732	-0.356***	0.700	-0.259***	0.771
	(0.027)		(0.033)		(0.018)	
MOM AGE AT FIRST BIRTH	-0.050***	0.951	-0.030*	0.970	-0.060***	0.941
	(0.015)		(0.017)		0.013)	
BLACK	0.854***	2.349	0.689***	1.991	0.658***	1.930
	(0.099)		(0.115)		(0.091)	
HISPANIC	0.352***	1.421	0.234		0.467***	1.595
	(0.125)		(0.145)		(0.090)	
OTHER RACE	0.446**	1.562	0.286		0.636***	1.888
	(0.188)		(0.207)		(0.117)	
INTERCEPT	0.292		0.567		-0.712	
	(0.480)		(0.549)		(0.453)	
Model Controls For Year	Yes		Yes		Yes	
Log-Likelihood	-8361.85		-4993.94		-3334.59	
number of observations	32454		15397		17057	
number of mothers	2114		2047		1879	

* significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level; Robust standard errors in parentheses.

Table A-1. GEE (Logistic) Regression Results for the First Three Children in Continuously Single-Mother Families.

	<100% of Poverty		*<150% of Poverty*		*<200% of Poverty*	
	Coefficient	*Odds Ratio*	*Coefficient*	*Odds Ratio*	*Coefficient*	*Odds Ratio*
BIRTHYEAR	0.003		0.021		-0.032	
	(0.106)		(0.100)		(0.108)	
EARLYYRS	0.341***	1.406	0.448***	1.565	0.634***	1.885
	(0.109)		(0.103)		(0.130)	
LATERYRS	0.381**	1.463	0.450**	1.568	0.573***	1.773
	(0.170)		(0.176)		(0.192)	
DISABKID	0.184		0.192		0.181	
	(0.161)		(0.176)		(0.183)	
EARLYYRS* DISABKID	-0.019		0.001		0.369	
	(0.177)		(0.184)		(0.239)	
LATERYRS* DISABKID	-0.055		0.015		0.255	
	(0.243)		(0.254)		(0.297)	
NDISABSIBS	0.466***	1.593	0.388***	1.474	0.782***	2.185
	(0.119)		(0.113)		(0.172)	
NNDAKIDS	0.416***	1.515	0.357***	1.429	0.550***	1.733
	(0.064)		(0.062)		(0.082)	
CHILD2	0.339***	1.403	0.379***	1.460	0.376***	1.456
	(0.112)		(0.112)		(0.127)	
CHILD3	0.842***	2.321	0.888***	2.430	0.942***	2.565
	(0.154)		(0.162)		(0.199)	
MOM YEARS OF EDUC	-0.252***	0.777	-0.248***	0.780	-0.308***	0.734
	(0.031)		(0.030)		(0.033)	
MOM AGE AT FIRST BIRTH	-0.052***	0.949	-0.059***	0.942	-0.060***	0.941
	(0.013)		(0.014)		0.014)	
BLACK	0.624***	1.866	0.585***		0.689***	
	(0.113)		(0.109)		(0.120)	
HISPANIC	0.387***	1.472	0.376**		0.412**	
	(0.158)		(0.167)		(0.198)	
OTHER RACE	-0.037		-0.241		-0.089	
	(0.233)		(0.258)		(0.342)	
INTERCEPT	1.078*		1.970***		4.299***	
	(0.510)		(0.502)		(0.536)	
Model Controls For Year	Yes		Yes		Yes	
Log-Likelihood	-5622.30		-5234.83		-4297.95	

Number of observations = 9,522; Number of mothers = 387.
* significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level; Robust standard errors in parentheses.

Table A-2. GEE (Logistic) Regression Results for the First Three Children in Continuously Married-Couple Families.

	<100% of Poverty		*<150% of Poverty*		*<200% of Poverty*	
	Coefficient	*Odds Ratio*	*Coefficient*	*Odds Ratio*	*Coefficient*	*Odds Ratio*
BIRTHYEAR	-0.610***	0.543	-0.493***	0.610	-0.359***	0.698
	(0.085)		(0.064)		(0.057)	
EARLYYRS	-0.433***	0.648	-0.218***	0.804	0.030	
	(0.085)		(0.072)		(0.062)	
LATERYRS	-0.518***	0.595	-0.260**	0.771	0.038	
	(0.164)		(0.117)		(0.092)	
DISABKID	-0.077		-0.012		-0.014	
	(0.102)		(0.094)		(0.086)	
EARLYYRS* DISABKID	0.329*	1.389	0.223*	1.249	0.206*	1.228
	(0.193)		(0.131)		(0.111)	
LATERYRS* DISABKID	0.319		0.248		0.205	
	(0.240)		(0.194)		(0.151)	
NDISABKIDS	0.714***	2.042	0.618***	1.855	0.511***	1.666
	(0.124)		(0.105)		(0.082)	
NNDAKIDS	0.422***	1.525	0.461***	1.585	0.451***	1.569
	(0.055)		(0.040)		(0.035)	
CHILD2	-0.087		-0.015		0.032	
	(0.073)		(0.064)		(0.058)	
CHILD3	-0.113		0.044		0.192**	1.211
	(0.105)		(0.090)		(0.083)	
MOM YEARS OF EDUC	-0.149***	0.861	-0.195***	0.822	-0.219***	0.803
	(0.016)		(0.014)		(0.013)	
MOM AGE AT FIRST BIRTH	0.003		-0.009		-0.016**	0.984
	(0.009)		(0.008)		0.007)	
BLACK	0.916***	2.499	1.085***	2.959	1.023***	2.781
	(0.089)		(0.081)		(0.080)	
HISPANIC	0.554***	1.740	0.780***	2.181	0.656***	1.927
	(0.087)		(0.077)		(0.072)	
OTHER RACE	0.420***	1.521	0.382***	1.465	0.218*	1.243
	(0.142)		(0.123)		(0.122)	
INTERCEPT	-2.075***		-0.649**		0.684**	
	(0.387)		(0.323)		(0.280)	
Model Controls For Year	Yes		Yes		Yes	
Log-Likelihood	-10555.76		-15141.68		-19805.85	

Number of observations = 39,107; Number of mothers = 1,217.
* significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level; Robust standard errors in parentheses.

[1] With the exception of the economically disadvantaged non-black, non-Hispanic sample who were dropped from the survey after the 1990 interview.

[2] Missing values were an issue in this data set because families didn't complete the survey at all in some years and/or because in some years families only partially completed the survey, most often not completing the income questions. Records indicating non-response for a given family in a given year were dropped from the sample. Incomplete responses were kept if family income and its relationship to the poverty line (given year and family size) could be reasonably estimated from other survey information.

[3] The NLSY79 reports family income as missing if any one of 19 separate income elements is missing. If earned income was reported, the missing element was re-coded to 0 and all elements re-added to create a family income variable. If earned income was among the missing income elements, it was created, if possible, by multiplying hours worked by wages and converting to an annual dollar amount. For two parent families, earned income was computed for both husband and wife and summed to equal family income. If earned income, hours of work, and pay rate were all among the missing elements, that observation year for that family was dropped.

[4] In the case of logistic regression, which is used to estimate employment status (0/1 dependent variable) here, it is necessary to transform each estimated coefficient to get an estimated effect. For small changes in a regressor, X_1, the marginal effect is computed as: $[B_1 * F(XB) * (1-F(XB))]$, where B_1 is the logistic regression coefficient and F(XB) is the predicted probability evaluated at the sample means. When X_1 is a dummy variable, we follow the method recommended by Greene (2003) and instead calculate the marginal effect as $(F(XB)|X_i = 1) - ((F(XB)|X_i = 0)$, where XB is evaluated at the sample means for all other variables.